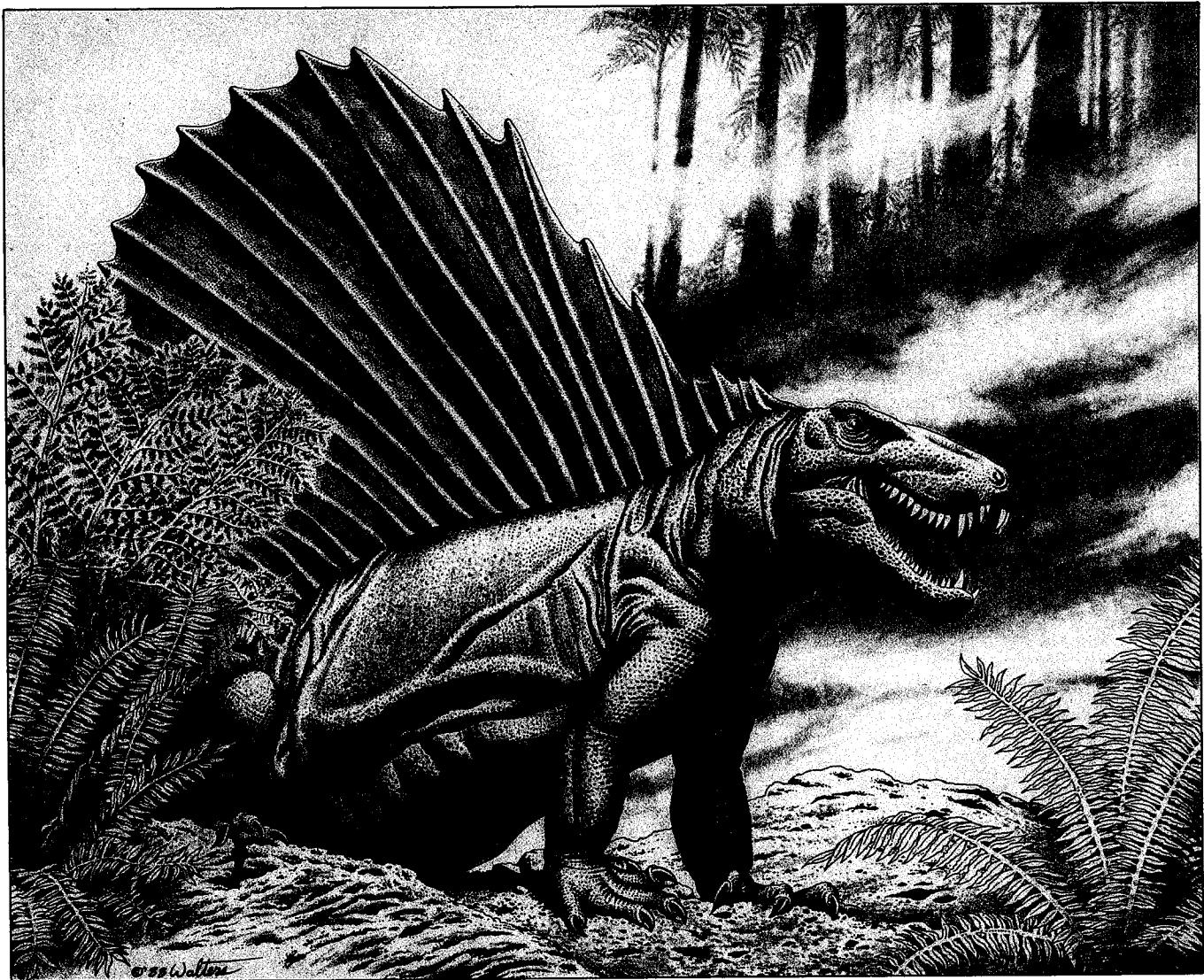


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Notes on Six Real and Supposed Type Fossils from the Newark Supergroup (Triassic) of Pennsylvania

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Abstract

Three specimens from the Triassic of Pennsylvania (Newark Supergroup) in the collections of the Academy of Natural Sciences are supposed to be the types of their species but for various reasons they are uncertainly, or definitely not, the types. These are the brachiopod *Cyzicus ovatus* (Lea, 1856), ANSP 16849 (Invertebrate Paleontology), a dubious type, and two vertebrate ichnospecies, "*Chelichnus wymanianus*" Lea, 1856, ANSP 16300 (Vertebrate Paleontology), a *nomen nudum*, and "*Anchisauripus gwyneddensis*" Bock, 1952, ANSP 16301, an improper replacement for a missing type. The two ichnofossil specimens, furthermore, have been identified as other ichnospecies. Three other types in the Invertebrate Paleontology collections have confusing published data which are in part erroneous; these data are emended in this paper. The species involved are "*Estheriella circularis*" Bock, 1946, and its senior synonym "*Estheriellites elliptoideus*" (Bock, 1946) Bock, 1953 (Cyzicidae, Genus *Cyzicus*); and *Gwyneddocris parabolica* Bock, 1946, ostensibly an arthropod species but which other workers believe is a ganoid fish.

Introduction

The Newark Supergroup (Triassic-Jurassic) of the northeastern United States contains an interesting paleofauna of invertebrates, vertebrates, and ichnites, which have been studied for a century and a half. Many type specimens of species have been taken from the Newark Supergroup. The paleontological collections of the Academy of Natural Sciences of Philadelphia (ANSP) include many type specimens from the Supergroup; six of these are involved in some confusion as to identity and systematic identification. The species involved are four of invertebrates and two of vertebrate ichnites. To emend or clarify the published reports and the ANSP collection records, each of these specimens has been examined.

ARTHROPODA: BRANCHIOPODA: CYZICIDAE

Cyzicus ovatus (Lea, 1856)

Specimen ANSP 16849 (Invertebrate Paleontology) is *Cyzicus ovatus* (Lea, 1856). Although it is clearly marked as being Lea's type, it is questionably the type.

On April 15, 1856, at a meeting of the Academy of Natural Sciences, Isaac Lea reported on several fossils he had found in the "New Red Sandstone Formation" near Phoenixville, Montgomery County, Pennsylvania (i.e., Lockatong Formation, Newark Supergroup; Triassic). This report was summarized in the minutes of the meeting (Lea, 1856, pp. 77-78), wherein Lea (p. 78) said that he had recognized two new species of "*Posidonia*" (= *Cyzicus*), to one of which he gave the name "*P.*" *ovata*. He described it as being "about seven-twentieths of an inch in transverse diameter * * * and being covered with numerous minute concentric costae over the whole disc." This is, unfortunately, the complete description of the type specimen, which was not figured by Lea.

Bock (1946, p. 10), in a note on the genus "*Estheria*" (= *Cyzicus*) from the Lockatong Formation, remarked, "We have not been able to locate Lea's specimens, nor have found any traces of *Estheria* yet at Gwynedd or Phoenixville." Later, in placing the species "*E.*" *ovata* in the genus "*Isaura*" (= *Cyzicus*), Bock (1953, p. 66) appended to a comment about his collection of a large number of specimens, "... but the most fortunate find was the rediscovery of Lea's dusty type specimen." He also noted (p. 67), that "The type specimen, as stated by Lea, was found near Phoenixville . . ." and he included in a table on the

same page measurements for the holotype (7 x 5 mm). In the Fall of 1986, I examined the specimen and saw that the larger of the two whole individuals on this rock is very neatly overlaid by a fragment of a third individual; this also is shown in Bock's figure (1953, pl. 11, fig. 1, the first time "Lea's type" was ever figured). This combination measures 0.33 inch (8.4 mm), which more closely approximates the 7/20-inch width given by Lea (1856), as compared to Bock's own measurements.

The specimen ANSP 16849 has affixed to it one of Bock's red-bordered gummed stickers, reading, "*Isaura (Estheria) ovata* (Lea) U. Trias. Gwynedd, Pa Type #200101." He published the catalogue number as ANSP Bock Collection no. 20010 (Bock, 1953, p. 67). The reverse of the specimen has written on it in block letters, "Lea's Type *Estheria ovata* Phoenixville." Also accompanying this specimen is a piece of manilla filing folder, bordered with red pencil, reading in Bock's own hand, "*Estherites (Estheria) ovata* Lea. Original Type Specimen". But, in the ANSP Invertebrate Paleontology catalogue, the entry for 16849 indicates that the specimen is "*Estheria minuta* Goldfuss" from Gwynedd, Montgomery County, Pennsylvania. Remarks in Bock's own hand are appended to the entry [sic!]: "Renamed, reidentified as *Isaura ovata*" and "Lea's type specimen see Jour. of Pal. 1953, No. 1."

The confusion of locality for this fortuitously rediscovered type specimen is reason enough to suspect that this might not be Lea's type specimen. That the specimen was unmarked before Bock added his annotations, that the only description of Lea's type is its 7/20-inch width, and that Bock's published width of the type does not equal 7/20 inch, all add more uncertainty to the claim that this is the refound type of Lea's species. But none of these observations definitely preclude the specimen as being, in fact, Lea's type. Part of the curatorial research done on this specimen in late 1986 and early 1987 included a thorough search of all the Academy's uncatalogued and catalogued specimens of *Cyzicus*, especially those of the Isaac Lea Triassic collection still retained in the Invertebrate Paleontology section. The search failed to yield anything close to the nebulous description of Lea's type; and the "refound" type in hand, despite the objections listed above, does in fact most closely resemble Lea's most brief of descriptions. Bock's notation in the catalogue, reidentifying this as Lea's type, might be attributed to the original cataloguer's failure to recognize the type, or perhaps to a straightforward clerical error. Bock's inappropriately worded emendation to the catalogue entry may have been simple clumsiness, not malicious intent to deceive.

In the absence of other specimens in the Academy's collection that have measurements close to Lea's published measurement for the type, and in the absence of definite information that would expose this type as a planted type, the specimen ANSP 16849 must be considered as the "dubiotype" of *Cyzicus ovatus* (Lea). It cannot be the type as certainly as Bock (1953) has suggested.

Cyzicus elliptoideus (Bock, 1946)
and *Cyzicus "circularis"* (Bock, 1946)

Several types described by Bock (1946) and emended by him in 1953 appear in the literature with several different confusing identifications and ANSP catalogue numbers. Furthermore, the

specimens in the Academy collections were mislabelled by Bock, adding to the confusion in identifying his type specimens. Curation of this material in 1986 and 1987 has clarified the problem and the emended information is included herein.

In 1946, Bock published the species "*Estheriella circularis*" and "*E. elliptoidea*", from a quarry in the Lockatong Formation at Eureka, Montgomery County, Pennsylvania. Bock listed the holotype specimens as ANSP 16847 and 16848, respectively; the Invertebrate Paleontology catalogue corroborates this, as does Richards (1968). Bock identified paratypes of these species, too. Although all the holotypes and paratypes are on the same piece of rock, Bock did not publish catalogue numbers for the paratypes. In 1953, Bock emended these species and synonymized them in a new genus, as "*Estheriellites*" *elliptoideus*. He published the holotype of this species as ANSP "16847-8" and a paratype on another rock as "200122" (a Bock Collection number). For some reason, they were recatalogued as ANSP 31198 (holotypes) and 31199 (paratype); but Bock mistakenly switched the gummed red stickers, affixed to the specimens, for the holotypes and the paratype. Richards (1968) also included "*Estheriellites*" *elliptoideus* in his catalogue, as ANSP "16847,48" (holotype) and "200122" (paratype).

The curatorial procedures currently in use in the Invertebrate Paleontology section of the Academy call for multiple species on single rocks to carry multiple catalogue numbers; this is to enable computerized cataloguing techniques to uniquely identify separate lots of each species. Similarly, holotypes and paratypes also carry separate catalogue numbers, with the holotype carrying the original catalogue number if a new one has to be assigned to the paratypic specimen(s). Therefore, the following emendation to the published information is in order (refer to Bock's [1946] original figure). The holotype of "*Estheriella circularis*" Bock, 1946, is ANSP 16847; the paratype is ANSP 65530. The holotype of the senior synonym of "*E. circularis*", *Cyzicus elliptoideus* (Bock, 1946), is ANSP 16848; paratypes are ANSP 31198 and 65528. ANSP 16847, 16848, 65528, and 65530 are all on the same rock. ANSP 31198 is a possible paratype, on a separate piece of rock. Bock's two original gummed stickers are affixed to the wrong rocks, switched holotype for paratype.

VERTEBRATE ICHNOTAXA

"Chelichnus wymanianus" Lea, 1856 [nom. nud.]

In the minutes of the same meeting at which Isaac Lea described "*Posidonia*" *ovata* (see above), Lea also noted that he had found some vertebrate footprints near Phoenixville in a stratum above those which yielded "*Posidonia*" (Lea, 1856, p. 78):

"Near to this locality and superimposed, Mr. Lea obtained a specimen of impure dull red limestone, which contained, on a partially decomposed surface, impressions presenting the appearance of *Foot-marks*, somewhat like *Chelichnus Duncani*, Owen, figured by Sir Wm. Jardine in his *Ichnology*, for which Mr. Lea proposed the provisional name of *Chelichnus Wymanianus*, after Professor Wyman, of Cambridge, Mass."

The species *C. wymanianus* was never published and, wanting for either a figure or description, it must be treated as a *nomen*

nudum. As a cited specimen by Lea, however, it is worthwhile to establish its true identity. The lot consists of two pieces of what an original label says was a 2-foot-long (0.6 m) trackway, each piece hosting a single print. Rediscovered in the Vertebrate Paleontology collection of the Academy, uncatalogued, in March, 1987, it is now catalogued in that department as ANSP 16300. There are three original labels accompanying the specimen, each in Lea's own hand: (1) "Equisetites?", (2) "a little like Batrichnis [sic] Lyellii Hark. pl. 13", (3) "Chelichnus Wymanianus Lea near Phoenixville, Pa. The track was nearly 2 feet long. Could only get this off—I.L."

Donald Baird (personal communication to W. B. Gallagher, 27 March 1987) has examined this specimen and has identified it as *Rhynchosauroides brunswickii* (Ryan & Willard, 1947).

"*Anchisauripus gwyneddensis*" Bock, 1952

The type of the ichnospecies *Anchisauripus gwyneddensis* Bock (ANSP 15222) is missing. Gillette (1978, p. 110) and Olsen & Baird (1986, p. 67) have also noted its disappearance. Baird reports (personal communication, 1987) that he had seen the type of *A. gwyneddensis* on display in the Academy of Natural Sciences, quite some time before the old Dinosaur Hall was dismantled in 1976. The specimen had been mounted behind a cut-out in the back wall of the case, so the size of the slab could not be seen. Furthermore, Baird, John R. Horner, and Paul Olsen all have searched the entire collection for the footprint, to no avail (Olsen & Baird, 1986; Baird, personal communication, 1987), a task which I fruitlessly repeated in 1987. (In addition, I also searched the Invertebrate Paleontology and Paleobotany collections, but failed to find the type, although a curious item then came to light, as discussed below.) The ichnospecies was described and figured by Bock (1952, p. 406, pl. 44) based on a single pes imprint; hence, it should be easily recognized if found.

Olsen & Baird (1986, p. 64) have placed *Anchisauripus gwyneddensis* Bock into synonymy, questionably, with *Atreipus milfordensis* (Bock, 1952), therein a new genus of Olsen & Baird. This synonymization was based on examinations of Bock's plate and the negative from which the photograph was printed. They remarked (p. 67) that the plate and the negative "are cropped too tightly to show whether or not there is an associated manus impression." The absence of the slab hosting the type specimen, and its cropped appearance in print and on display, makes the task of comparison with other tracks both difficult and of less reliable scientific value; hence Olsen & Baird's questioned synonymy.

In March, 1987, in the ANSP Paleobotany collection (!), I came across a slab with a footprint on it, marked, apparently in Bock's own hand, "Replacement #15222. Anchisauripus gwyneddensis Bock 1952 pl. 44". It also carried the paleobotany catalogue number 3911. The only feasible scenario on how this specimen arrived in the paleobotany collection is that it was mistakenly stored with the fossil plant material that had been removed from the Dinosaur Hall exhibits. By the high paleobotany catalogue number, it seems to have been catalogued into that collection around 1975, at the end of the project which catalogued the fossil plant collection for the first time (see Spamer, 1988). Comparing the "replacement" against Bock's (1952, pl. 44) illustration, however, instantly proved that the

footprint is not the missing type of *A. gwyneddensis*. This specimen is a positive cast, whereas the type is a negative impression. The plane on which the cast appears seems to have been shattered and repaired; but, even so, the observed flaw passing across the slab hosting the type (see Bock's plate) is not present. Furthermore, Donald Baird (personal communication to W. B. Gallagher, 27 March 1987) examined the "replacement type" and has identified it as *Anchisauripus sillimani* (E. Hitchcock, 1843), and that the slab lithologically resembles the Jurassic strata of the Connecticut Valley, not the Triassic of Pennsylvania. (It is now catalogued into the Academy's Vertebrate Paleontology collection as ANSP 16301.)

At the time the old Dinosaur Hall was dismantled, in preparation for exhibits celebrating the United States bicentennial which in turn was replaced by the current Dinosaur Hall, the geological department of the Academy was in transition, both organizationally and physically. It is feasible that the type was lost at that time. It is as equally feasible that the type was lost, damaged, or destroyed long before Dinosaur Hall was dismantled—and that the poorly seen specimen on display was actually the replacement which turned up in the Paleobotany Collection!

Based on Bock's treatment of the (dubious) type of *Cyzicus ovatus* (Lea) (see above), we have here some justification in suggesting that the "replacement" for the type of *A. gwyneddensis* is another Bock foible. This is conjecture, to be sure, but the precedent exists. In the case of *Cyzicus ovatus*, Bock clearly demonstrated that he did not have a good knowledge of taxonomic procedure and protocol; otherwise, he would not have said that the type had been found without stating his reasons for believing it to be the type, nor would he have made such a confusing remark in the catalogue. That the label on the false *A. gwyneddensis* appears to be in Bock's own hand points to a similar impropriety for this ichnospecies, only this time it is certainly improper. In any event, a neotype cannot be allowed in the matter of *A. gwyneddensis*. According to the rules set down in the *International Code of Zoological Nomenclature*, this species is already "well documented" in available literature by its original plate and description (whereas Lea's was so poorly documented that it is impossible to definitely call any specimen not marked by Lea the type of that species).

The type of *A. gwyneddensis*, ANSP 15222, may yet turn up. Much of the Bock collection is not available, probably still in the private hands of his heirs. Of the entire published component of the Bock Collection of Triassic invertebrates, vertebrates, plants, and ichnofossils, comprising 657 lots, less than 15 percent is accounted for in the Academy's collections. The remainder, as was much of Bock's unpublished material, may have been in his possession at the time of his death. It is possible, though not provable at this time, that he could have kept the type of *A. gwyneddensis* for his production of casts of vertebrate ichnofossils. It is possible, too, that the type suffered a mishap, which Bock attempted to rectify through the "replacement." Perhaps time will tell all.

PISCES

"*Gwyneddocaris parabolica*" Bock, 1946

Bock (1946) published a lengthy description of a new genus and species of arthropod, based on a unique specimen obtained from spoil piles of the Lockatong Formation at the Reading Railroad tunnel in Gwynedd, Montgomery County, Pennsylvania. He named this *Gwyneddocaris parabolica*; the specimen is ANSP 16850 (Invertebrate Paleontology).

Buried in a volume of the *Treatise on Invertebrate Paleontology* (Rolfe, 1969, p. R330), the genus *Gwyneddocaris* Bock is listed in the section "Nonphyllocardid and uncertain genera," within the subsection "Genera uncertain." In that entry is a note expressing the opinions of D. Baird and H. F. Roellig that the unique specimen shows the midline of a ganoid fish. This remark does not seem to have been published elsewhere, and therefore attention is brought to it here. Baird (personal communication, April 1987) still believes this specimen to represent a ganoid fish.

Acknowledgements

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